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I hereby declare and state:

that I am thoroughly conversant in both the Korean language and the English language;

that I am presently engaged as a translator in both the Korean and English languages; and

that the attached document represents a true and complete English translation of Korean Patent Application No. 10-2002-0077595 filed on December 7, 2002.

I further declare that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 16th day of January, 2008



Translator: Hyung Nam KIM



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ABSTRACT

Summary

A method for controlling a playback in an interactive optical disc player is disclosed. An interactive recording medium reproducing apparatus reproduces A/V data recorded on an interactive recording medium such as an interactive DVD in conjunction with contents data provided by a contents providing server using navigation information for the contents data also provided by the contents providing server, thereby allowing synchronized reproduction of data from different sources.

Key Figure

Figure 1

Key Words

Interactive disc, contents providing server, navigation information, link list, content unit

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SPECIFICATION**Title**

METHOD FOR CONTROLLING A PLAYBACK IN AN INTERACTIVE OPTICAL DISC
PLAYER

Brief Description Of The Drawings

FIG. 1 illustrates an interactive optical disk reproducing apparatus in which the present invention may be advantageously embodied;

FIG. 2 illustrates the relationship among an A/V data stream, contents navigation information, and contents data files in accordance with the present invention; and

FIG. 3 illustrates an embodiment of contents navigation information in accordance with the present invention.

Major Elements In Drawings

10 : interactive disc	11 : optical pickup
12 : IDVD system	13 : microprocessor
14 : buffer memory	15 : internet interface
100 : interactive optical disk reproducing apparatus	
200 : internet	
300 : contents providing server	

Background Of The Invention

The present invention relates to a method for controlling a playback in an interactive optical disc player which reproduces A/V data recorded on an interactive recording medium in conjunction with contents data recorded thereon or contents data provided by a contents providing server connected through the Internet.

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High-density optical disks capable of recording large amounts of data are being widely used. The Digital Versatile Disc (DVD), which is a recording medium that is capable of recording large amounts of high-quality video data as well as digital audio data, is one example of these high-density optical disks.

The DVD includes a navigation data recording area in which navigation data required for playback control of A/V data is recorded and a data stream recording area in which digital data streams are recorded.

When a DVD is loaded into a DVD reproducing apparatus, the DVD reproducing apparatus first reads the navigation data recorded in the navigation data recording area and stores the navigation data in an internal memory. The DVD reproducing apparatus then begins reproduction of the DVD using the stored navigation data, thereby providing various functions of the DVD to a viewer.

The development of new interactive DVDs is being progressing rapidly. Unlike the DVD, the interactive DVD (I-DVD) contains additional contents data, which is detailed information about A/V data recorded thereon and provides the contents data through a user interface. The contents data may be recorded on the I-DVD as html files.

In addition, a method for obtaining additional contents data from a contents providing server connected through the Internet while reproducing A/V data and contents data recorded on the I-DVD is under discussion. However, a method for effectively managing reproduction of A/V data and contents data responsive to a viewer's request is not yet available.

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Explanation Of The Invention

The present invention has been made in view of the above problems, and it is an object of the present invention to provide a method for controlling a playback in an interactive optical disc player which can reproduce data recorded on an interactive recording medium in conjunction with contents data provided by a contents providing server using navigation information for the contents data also provided by the contents providing server.

In accordance with the present invention, the above and other objects can be accomplished by a method for controlling a playback in an interactive optical disc apparatus, comprising the steps of storing navigation information for contents data transmitted from a contents providing server in the apparatus, and presenting A/V data of the interactive optical disc in conjunction with contents data received from the contents providing server using the stored navigation information.

Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings.

FIG. 1 illustrates an interactive optical disk reproducing apparatus in which the present invention may be advantageously embodied. The reproducing apparatus 100 comprises an optical pickup 11, an IDVD system 12, a microprocessor 13, a buffer memory 14, and an Internet interface 15 through which the apparatus 100 is connected to a contents providing server 300.

The IDVD system 12 includes a DVD engine for reproducing A/V data recorded on an I-DVD 10 and an enhanced navigation (ENAV) engine for reproducing contents data provided by the contents providing server 300 or contents data recorded on

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the I-DVD 10.

The IDVD system 12 outputs the contents data in synchronization with the A/V data from the IDVD 10. As shown in FIG. 1, the reproducing apparatus 100 is connected to the contents providing server 300 through the Internet interface 15 by the mutual operations of the microprocessor 13 and the ENAV engine included in the IDVD system 12.

ENAV contents data, which is associated with the A/V data being reproduced from the I-DVD 10, is downloaded from the contents providing server 300 and then temporarily stored in the buffer memory 14. The buffer memory 14 can be logically divided into a first buffer (buffer 1) and a second buffer (buffer 2).

The ENAV engine in the IDVD system 12 outputs the A/V data from the I-DVD 10 in synchronization with the ENAV contents data from the I-DVD 10 or outputs the A/V data from the I-DVD 10 in synchronization with the ENAV contents downloaded from the contents providing server 300.

The contents providing server 300 provides various ENAV contents data associated with the A/V data recorded on the I-DVD 10 as a plurality of data files and provides ENAV navigation information for controlling a playback of the data files.

As shown in FIG. 2, for example, a title of the I-DVD 10 is organized into individual chapters (Chapter#1, Chapter#2, ...) and one or more data files (File#1, File#2, ...) corresponding to each of the chapters are organized as an ENAV unit. Navigation information for managing the data files included in the ENAV unit is provided as ENAV unit information (ENAV_Unit_Info).

The multiple pieces of ENAV unit information (ENAV_Unit#1_Info, ENAV_Unit#2_Info, ...) are defined as a link list and transmitted along with the ENAV contents data

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files or transmitted before the ENAV contents data files are sent.

As shown in FIG. 3, the ENAV unit information includes file names of data files included in the associated ENAV unit (File(s) Name), addresses of the data files in the contents providing server 300 (File(s) Address), the presentation time of the associated ENAV unit (ENAV_Unit_Presentation_Time), and the total size of data files included in the next ENAV unit (Next_ENAV_Unit_Total File(s) Size).

The microprocessor 13 controls the DVD engine and the ENAV engine included in the IDVD system 12 using the ENAV unit information of the link list provided by the contents providing server 300.

The microprocessor 13 correlates chapters of the A/V data stream reproduced by the DVD engine with data files reproduced by the ENAV engine using the fields of 'File(s) Name' and 'File(s) Address' included in the ENAV unit information.

In addition, the microprocessor 13 estimates the total presentation time of the ENAV unit being reproduced and determines if the total size of data files of the next ENAV unit exceeds the size of the remaining space of the memory buffer 14 using the fields of 'ENAV_Unit_Presentation_Time' and 'Next_ENAV_Unit_Total File(s) Size' included in the ENAV unit information. If the presentation of the ENAV unit being reproduced requires quite a long time, the microprocessor 13 sends a command to the contents providing server 300 to delay the transmission of the next ENAV unit data files by the contents providing server 300 for a prescribed time.

If the total size of data files of the next ENAV unit exceeds the size of the remaining space of the memory buffer 14, the microprocessor 13 sends a command to the contents providing server 300 for requiring that the contents

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providing server 300 transmit the data files of the next ENAV unit sequentially by organizing them into several groups or compress the data files before transmission so that the total size of the compressed data files may become less than a prescribed limit.

By the aforementioned procedure, the interactive optical disk reproducing apparatus 100 can reproduce A/V data from the I-DVD 10 in conjunction with the ENAV contents data provided by the contents providing server 300.

One ENAV unit may correspond to more than one chapter and one chapter may correspond to more than one ENAV unit. The link list may include other navigation information as well as the ENAV unit information and may be defined as other names such as ENAV playlist.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Effect Of The Invention

The method for controlling a playback in an interactive optical disc player in accordance with the present invention allows synchronized reproduction of data from different sources in an interactive optical disk reproducing apparatus.

WHAT IS CLAIMED IS:

1. A method for controlling a playback in an interactive optical disc apparatus, comprising the steps of:
storing navigation information for contents data

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transmitted from a contents providing server in the apparatus; and

presenting A/V data of the interactive optical disc in conjunction with contents data received from the contents providing server using the stored navigation information.

2. The method set forth in claim 1, wherein the contents data is transferred in a form of a plurality of data files and temporarily stored in a buffer of the apparatus.

3. The method set forth in claim 2, wherein the navigation information includes at least one of file names for data files of the contents data to be reproduced in conjunction with the A/V data read from the interactive optical disc, addresses of places in which the data files are stored, presentation time of each of the data files, and size information for data files that will be received next.

4. The method set forth in claim 3, wherein the presenting step includes steps of reading the data files temporarily stored in the buffer and presenting the read data files in conjunction with the A/V data.

5. The method set forth in claim 3, wherein the presenting step further includes a step of sending a request to the contents providing server for requiring that the contents providing server delay transmission of next data files for a prescribed time, with reference to the presentation time information included in the navigation information.

6. The method set forth in claim 3, wherein the presenting step further includes a step of sending a request to the contents providing server for requiring that the contents providing server divide next data files into several groups and transmit the groups individually, with reference to the size information of the next data files included in the navigation information.

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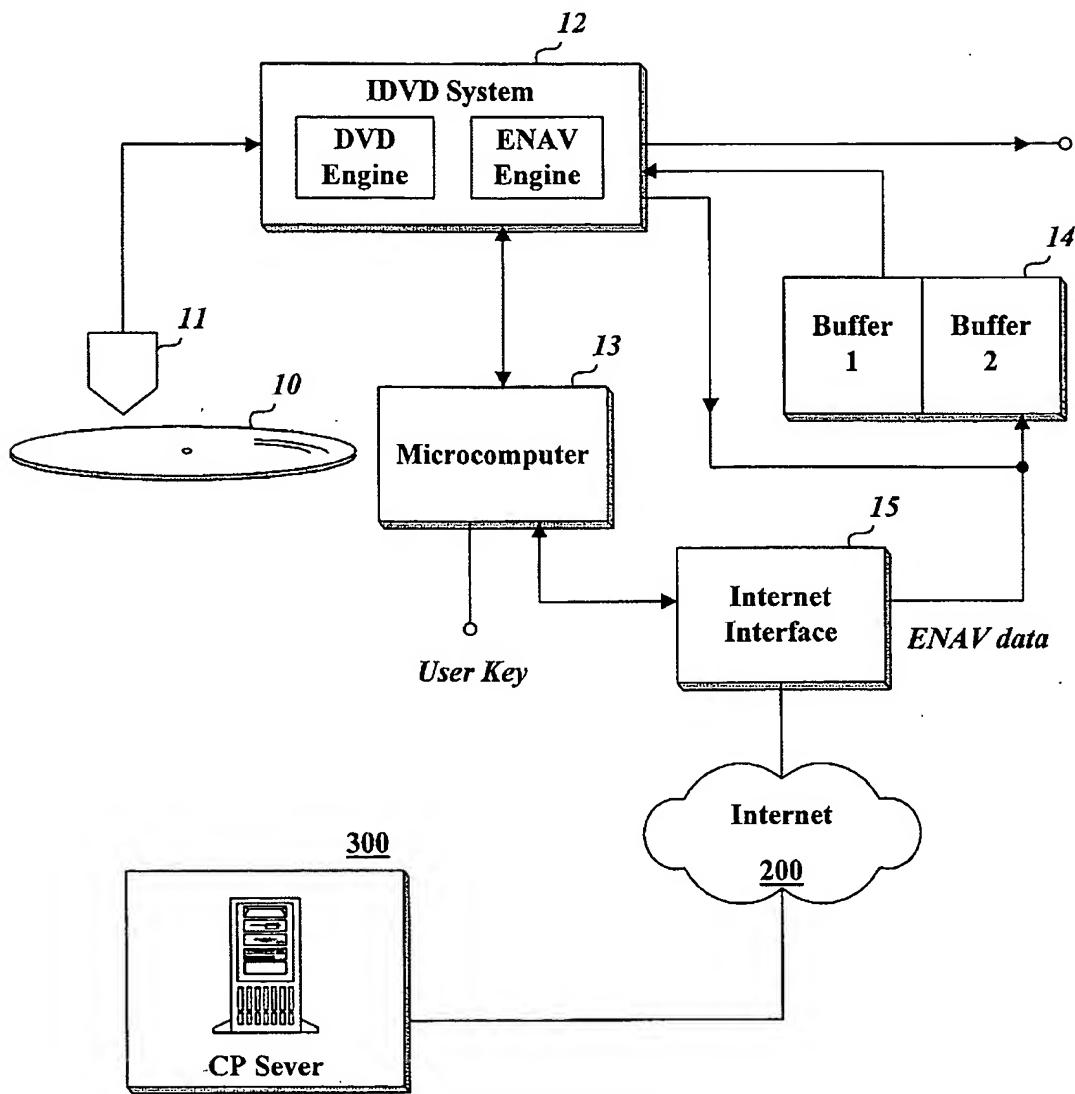
7. The method set forth in claim 3, wherein the presenting step further includes a step of sending a request to the contents providing server for requiring that the contents providing server compress next data files before transmission, with reference to the size information of the next data files included in the navigation information.

8. The method set forth in claim 6 or claim 7, wherein the presenting step further includes a step of sending a corresponding command to the contents providing server if the size of the next data files exceeds a remaining space of the buffer.



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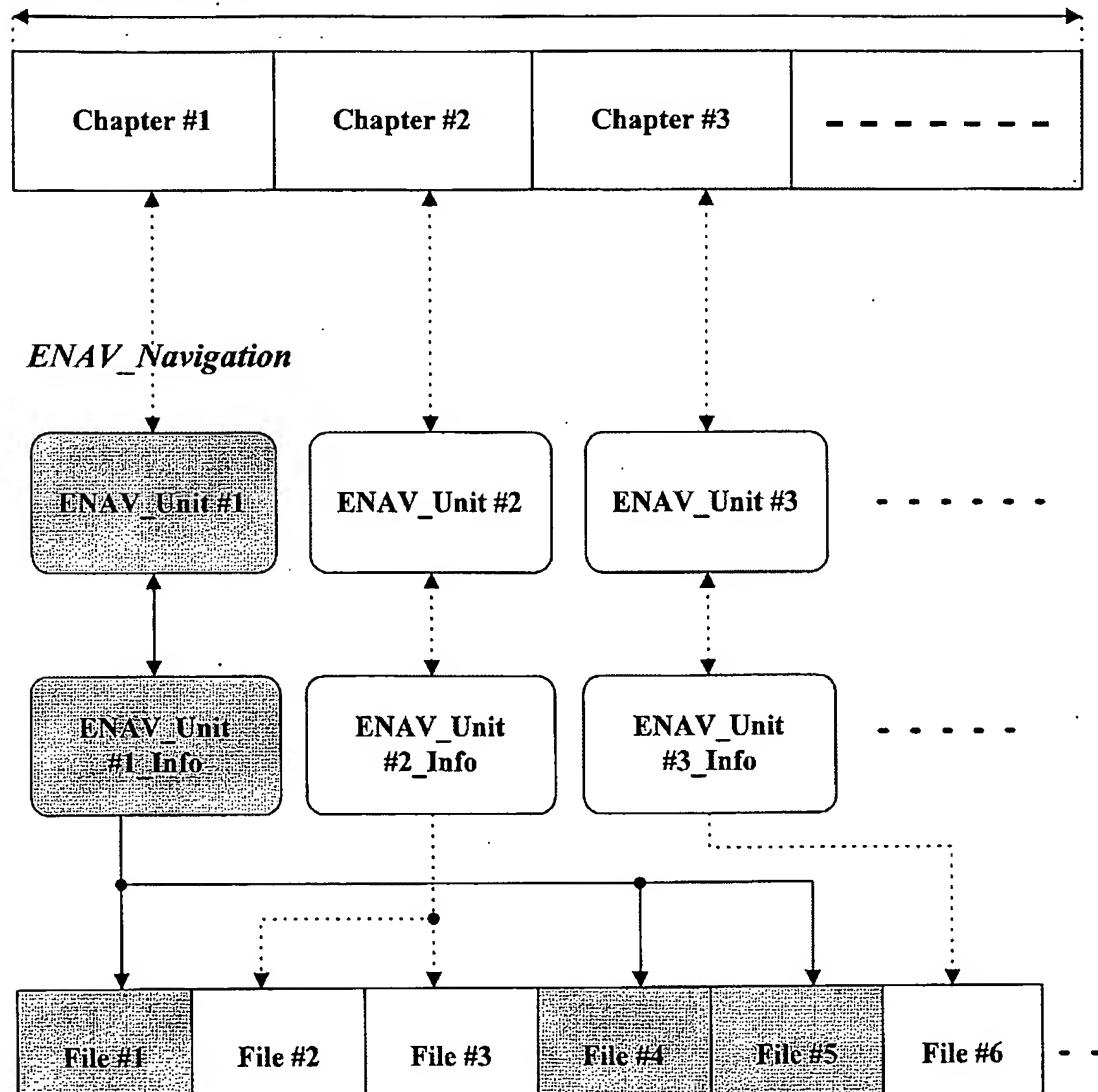
FIG. 1



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FIG. 2*A/V Data Stream*

Title #1



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FIG. 3*ENAV_Navigation*